

MARCH 8, 2017

A CITY PLANNER'S ABBREVIATED RESPONSE TO COMMENTS ON STREAMLINING DEPLOYMENT OF SMALL CELL, AND "NOT-SO-SMALL CELL" INFRASTRUCTURE

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"Small Cells"



Without collaborative City input:

**"Small Cell" at
4471 Moraga Ave
Oakland**

***(bulky boxes, tacky
bundles of wiring below
unpainted antennas and
noisy cooling fans)****

**With collaborative City input:
Verizon at 1367 Jones Street
in San Francisco
(unobtrusive and noiseless)**



The All Too Obvious Disclaimer: These comments are written in my personal capacity and do not represent the various cities where I have served as a City Planner, and have been involved in hundreds of wireless projects. Many of these comments also represent my interactions (on wireless siting) with a wide number of Planners and Public Work Engineers, from across the Country, whether they serve big cities or small towns.

Some of these comments reflect lessons that I have learned from the many talented and passionate women and men working in the wired and wireless communications industry. Whether as a City Planner, or many years ago as a former US Army soldier (*where communications are vital*).

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The proposals put forward by Mobilitie reflect an important inflection point in wireless siting, that has been until recently largely shaped by the 1997 Telecommunications Act and the “least intrusive” siting decisions supported by multiple Federal Circuit Court decisions.

Wireless siting in the 1990s largely consisted of steel towers (monopoles with large equipment cabinets and diesel generators) a few miles apart, in order to support voice coverage. The first local government (City/County) rules often sought to balance concerns over proliferation and the competitive nature of the industry (with up to seven competing carriers in a given market) by pushing wireless carriers to collocate (place individual sets of antennas and equipment, for each carrier, on the same tower) monopole sites, whenever feasible.

Over time carriers also began using stealthing (screening) elements such as fiberglass (or “FRP”) that is painted and textured to mimic fake roofs, vent pipes, elevator penthouses; and of course, the infamously bad fake palm and pine trees (*though there are a few decent examples by a minority of contractors*). These sites were primarily located on private property, such as the spire of a church, or roof of a commercial or apartment building¹.

While these macro (large) sites continue to undergo upgrades and densification (more sites added closer to each other), carriers have also sought to develop Small Cells, and “Not-So-Small Cells,” within buildings for indoor coverage², and within the public right-of-way (streets, road shoulders and sidewalks).

These public right-of-way sites (referred to as Small Cells, or outdoor Distributed Antenna Systems, or “oDAS”) have typically involved the attachment of antennas and equipment (computers and optional batteries) cabinets on existing utility poles. In some instances, carriers have sought large equipment cabinets for batteries, computers, or backup diesel generators on the ground surrounding these poles.

The challenge of such facilities includes systems that are inappropriate, especially in residential areas or historic districts, such as large cabinets the size of a refrigerator, with noisy cooling fans (to cool the computers) mounted a few feet from a bedroom bay window in dense area of town. Or, ground-mounted cabinets that impede use of the sidewalk for the handicapped, and present a sight obstruction hazard for drivers backing out of their own driveway. In many instances the laws essentially written at State and Federal levels by teleco lobbyists advertise well-designed Small Cells but allow a sort of anything goes regulatory regime (e.g. no height or noise limits, no separation distances from bedroom windows).

In some instances, carriers have proposed brand new wooden poles (30-50 feet in height) or new steel poles (up to 120 feet height – for Mobilitie) in the public right-of-way under the guise of being a Small

¹ See examples at: <https://www.slideshare.net/omarmasry/slides-from-a-wireless-cellular-design-panel>

² The energy efficient glass found in new construction tends to block cell signals so carriers install low power cell antennas in many large buildings/offices/hotels.

Cell, when they appear to mimic the same potentially negative effects³ of monopoles; that seems somewhat regressive in terms of the overall trend line in better designed wireless infrastructure.

In sum, the use of Not-So-Small-Cells represents a significant reversal in a generally positive approximately 15-year long trend line toward less-intrusive wireless siting that still allows for competitive and robust broadband siting by using well-designed Macro sites (typically hidden rooftop-mounted antennas) and well-designed Small Cells (that are actually small, and quiet) to augment

(compliment) coverage and provide high speed data capacity.

Especially in dense urban areas (where rooftop antennas have limitations) and suburban/exurban areas (where there are limited rooftop opportunities⁴ for even basic voice coverage).



Why is this proposed 120-foot tall “Small Cell” so tall and so close to the residential driveways? It appears it is so that “Mobilitie” (Sprint’s network partner – & no relation to AT&T Mobility) can save money by using microwave dishes to “talk” to the cell antennas on shorter poles nearby (see image further below). This means using microwave dishes instead of running fiber-optic cables for miles (below City streets or on existing wooden utility poles) for what is known as backhaul (backhaul = connecting your cell phone to the cell antennas and then ultimately back to the internet/switch center). There is the significant concern that if a City allows this

type of approach (towers, rent-free in the right-of-way), that the community could lose control of their public right of way. (e.g. more boxes to accidentally back into as you exit your home). Because these poles are not likely co-locatable; it means the other three major wireless carriers would need to install their own poles nearby, if they choose a similar path, in order to save money on fiber-optic backhaul. Plus, if this path was pursued by one wireless carrier, then one would wonder why other wireless carriers would think of continuing to paying a landlord to host multiple antennas on the same pole/rooftop, on private property, for multiple carriers (less-intrusive); when they can each put up their own poles, rent-free in the public right-of-way. In urban areas you may eventually see new microwave dishes (to backhaul data from new small cells nearby) show up on existing Sprint/Nextel/Clearwire rooftop-mounted cell sites.

³ In some rural areas where crop dusting may occur, a poorly thought out monopole may require blinking aircraft warning lights at night, disturbing the rural character. Removing local discretion over siting, even if a monopole is appropriate in concept could negate the ability to require a modest relocation to avoid these types of instances.

⁴ Typically found on churches, water tanks, water towers, office buildings, and larger apartment buildings.

SECTION BRAVO**| Mobilitie Challenges & Overall Downstream Concerns**

To date, many Planners, Public Works Engineers, City Council members, along with those working in the wireless industry have voiced concerns with some the following observations regarding Mobilitie's statements, actions, and apparent business model.

Some of the earliest concerns were initially voiced first by wireless industry folks who aren't exactly shy to occasionally gripe about local government permitting, but found themselves shocked by Mobilitie's seemingly cowboy/cavalier attitude. This includes:

- The proposed use of multiple 120-foot tall steel microwave backhaul poles in the public right-of-way within a given community, which represents an optional, and highly-intrusive network deployment model.

The placement of such poles in the public right-of-way would appear to offer Mobilitie (and their apparent network benefactor – Sprint/Softbank) a two-fold advantage:

By placing these poles in the public right-of-way these poles can be placed rent-free (in most States, including California), even if in front of a residential bedroom window (unless you live in a gated community), and the carrier can avoid the costs associated with leasing private property to place microwave backhaul dishes (mostly hidden), for example, on the roof of a commercial building, church, water tower, or existing cell tower nearby.

- By using these “mothership” microwave backhaul nodes (locations), it appears Mobilitie, and their benefactor (Sprint/Softbank) can avoid the costs associated with fiber-optic backhaul, which is nearly universally used by the majority of Tier 1 PCS carriers (the 4 major wireless carriers) and their network partners (such as Extenet Systems, Zayo, and Crown Castle). In other words, instead of building actual Small Cells on existing light/utility poles and connecting the nodes (locations) to the phone/internet network, via cables running back to a data center switch (like most carriers do); they can clutter the region with these mega poles instead of using fiber-optic backhaul



A proposed 120-foot Mobilitie monopole on a narrow sidewalk in the Pacific Northwest (photo simulation).

- Many cities and counties have expressed concerns with instances where it appears Mobilitie installed sites without permission from the local government, including the addition of brand new wooden poles (and ground-mounted equipment boxes) in areas where the community had already invested in undergrounding. In one instance in Baltimore⁵, it appears Mobilitie installed a large concrete base the size of a refrigerator on top of an existing sidewalk and a brand new Small Cell pole, without obtaining permission from the City, for what would appear to be a wholly inappropriate installation blocking the sidewalk. In Dennison, Texas, Mobilitie apparently constructed a 120-foot tall pole without local approval. See other examples noted in comments submitted by the California League of Cities.
- Many cities and counties have expressed concerns with Mobilitie pushing for the ability to install their own brand new wooden pole for a Small Cell, in order to (apparently) avoid the leasing costs associated with attaching antennas and equipment to an existing light or utility pole nearby, owned by either the local investor-owned utility or the City/County itself. This sort of reflexive deployment model sets a poor precedent as other carriers may seek the same treatment (i.e. more poles) in a pro-competitive regulatory environment.

⁵ <http://wirelessestimator.com/articles/2016/one-company-fined-for-not-getting-a-small-cell-permit-another-for-not-permitting-inspectors/>

- A few cities and counties have expressed concerns where it appears the Mobilitie representative they happened to meet with claimed their 120-foot tall ("mothership backhaul") pole was approved by a nearby city/county; when it turns out no such approval was granted.
- Many cities and counties have expressed concerns over what appear to be deceptive names on applications, as they seem to confer a government authority status (e.g. California Utility Pole Authority, Maryland Utility Pole Authority, Interstate Transport and Broadband) for what are essentially cell antennas serving a commercial carrier (appears to primarily be for Sprint).
- Planners and Public Works Engineers have expressed concerns over the inadequate quality and scope of submittals by Mobilitie with instances such as:
 - Regional deployment maps showing poles in the middle of a pond or a footbridge.
 - Plans and photo simulations that appear inconsistent with each other, lacking detail or showing the wrong locations.
 - Repeated requests by local government staff to fix errors on submittals that are often only partially fulfilled, resulting in wasteful expenditures of limited staff resources to engage in repetitive reviews with a rotating set of contacts.

In one instance a firm bidding to complete plan submittals for Mobilitie indicated the price points were so low that quality would be sacrificed and any revisions would be infeasible on a cost basis.

- An instance where a design I worked on (for Extenet/Verizon Small Cell on a steel light poles) was passed off by Mobilitie as their own design to a City Planner in Southern California that I happened to be friends with from back when I was an intern working in the Los Angeles area. The Extenet/Verizon design, with an radome design that a coworker and myself helped design, reflected an entirely different technology and set of form factors (with an inherently more compatible design) than that being proposed by Mobilitie.

SECTION CHARLIE | Other Neutral Host and Tier 1 Carrier Challenges

The challenges noted in Small Cell siting are not exclusive to Mobilitie. While local governments can and should do more to streamline review, that streamlining should not hew toward simply rubber stamping designs that look like something put together using the parts bin at the back of Radio Shack, when there is no lack of off-the-shelf tools, techniques and talent to build well-designed wireless infrastructure.

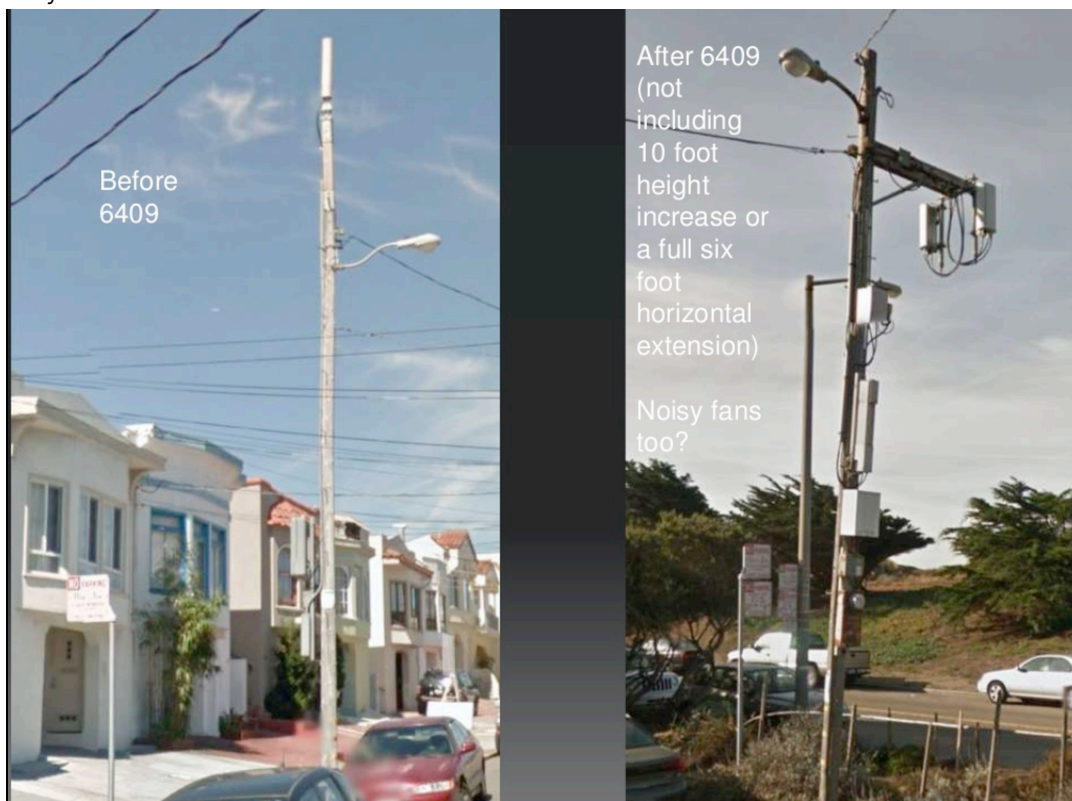
Some of the challenges noted below apply to either Extenet Systems or Crown Castle, or both:

- Carrier attempting to bully local government by claiming a utility status and indicating the City/County has no review authority whatsoever (whether over design, noise standards, permitting). This is generally false.
- Carrier trying to claim that “6409” rules requires immediate approval of new wireless facilities when “6409” only applies to changes to existing wireless facilities that were legally constructed.
- Carriers building sites without permits, or sites built in a manner that leads to unsafe pole overloading. This contributed to the devastating 2007 Malibu (California) fires⁶.
- Carrier providing apparently false information to City staff, claiming utility regulations that do not exist. In one instance the carrier claimed they had to increase the height of existing wooden light poles, in a historic residential district (with bedroom windows within a few feet of the window) by over 9+ feet in order to meet pole safety requirements. Staff expended significant time researching applicable regulations. When the carrier cited the FCC’s Shot Clocks to require a decision, staff denied several the applications as being inappropriately designed, given the neighborhood context. Within (seemingly) hours of the denial, the carrier indicated they could design the facilities without the substantial height increase.
- Carrier knowingly leaving required equipment out of photo simulations, resulting in numerous revisions and design mockups; then blaming the City for the delays.
- Carrier agreeing not to tear up sidewalks and using bumpy asphalt patches, then doing just that (instead of replacing concrete with concrete in an appropriate manner).
- Carrier taking months to obtain internal review to utilize a narrower battery back up cabinet (made by TSI Power) that was about as wide as the pole, instead of the originally proposed Alpha cabinet that was about 3 times as wide as the pole and more likely to impair views from neighboring bedroom windows.
- Carrier making false claims at public hearings (indicating incorrect reasons why a different pole was not chosen), or failing to properly complete notification.

⁶http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Organization/Divisions/Policy_and_Planning/PPD_Work/PPDUtilityPole.pdf

- Carrier getting caught adding equipment not authorized to pole multiple times, then threatening to build the site to “look right” then “6409’ing” the pole to add whatever equipment they want and “make the site look as ugly as they want.”
- Carrier proposing ugly and distracting multi-panel antenna designs (with visible bracket and cabling) on a wooden utility pole in front of a home, claiming a radome antenna won’t work, then admitting the antenna model late suggested by City staff would work after being pressed on the matter.
- Carrier agreeing to specific conditions of approval then failing to build the site correctly.
- Carrier submitting applications to the wrong agency despite being told earlier to check certain locations to make sure the proper jurisdiction was contacted.⁷
- See other examples cited by the California League of Cities.

Any expectation of size on a Small Cell should also take into account the ability (based on a 2014 FCC Proceeding referring to Section 6409 of the Middle Class Tax Relief and Job Creation Act) for a carrier to modify a Small Cell as soon it is built, into a ugly and noisy Small Cell, without effective input by a community.



⁷ Examples known to author, and also cited by an engineer who opposes poorly designed wireless facilities in Palos Verdes (Los Angeles area) at: <https://nouglytowers.com/>. Please note, the author’s opposition is focused on design, placement, and conduct (primarily by Crown Castle), and is not based on RF concerns.

SECTION DELTA | **"It takes a lot of wires to go wireless." Recommendations for improving broadband siting**

The FCC and State Governments can take concrete actions to improve broadband siting by considering the following:

1. Requiring investor-owned utilities to allow wireless "smart" electric metering, to avoid the need for bulky electric meter cabinets on poles or on standalone meter pedestals on busy sidewalks⁸. Carriers prefer not to install these either.
2. Supporting working groups to highlight best practices in wireless facility siting and equipment design.
3. Creating sample appraisal rates and master license agreements using examples from various US cities.
4. Amending 6409 rules (changes to existing wireless facilities) to ensure carriers cannot take well-designed and quiet (cooling fans) Small Cells, and turn them into poorly designed monopoles with bulky equipment cabinets and noisy cooling fans.
5. Avoiding rate regulations that remove the ability for cities/counties to ensure carriers do not "pole squat" on select poles at busy intersections. These anti-competitive actions require a degree of review by local governments in dense urban environments.
6. Also, avoiding instances where a City/County cannot use pricing mechanisms to encourage better designs (e.g. fewer bulky ground mounted equipment cabinets) or multi-carrier serving Small Cells.
7. Supporting more model legislation on micro trenching and Dig Once policies.
8. Requiring investor owned utilities (typically the only game in town for underground conduit for fiber-optic backhaul) to allow reasonable access to both cellular carriers, municipalities and other competitors in the wired broadband market.

⁸ Pacific Gas & Electric, an investor-owned utility serving much of Northern California has begun using such as system. It utilized an antenna the size of a grapefruit to communicate with the smart metering network.

9. **Smart Cities and Cellular**

While “cellular” carriers like to tout “Smart Cities,” to seek bargain lease rates and little in the way of design/noise review; the wired and wireless infrastructure for a Smart City goes beyond cell antennas. For a City to be “smart” it must serve a wide swath of society, including people and small businesses that cannot always afford tethering rates for cellular data or contend with the challenges of throttling (whether based on content if net neutrality is dismantled) and the inherent capacity challenge of wireless infrastructure (even with “5G” and fixed wireless” nothing really quite beats fiber-optics).

Smart cities should incorporate not only robust and competitive cellular networks that do not detract from streetscapes, but also include:

- Smart sensor networks (read: Internet of Things, or IOT) to improve mobility, parking, waste management, air quality sensors, opt-in tracking of persons with disabilities such as dementia, tracking of stolen bicycles, improved landscape irrigation and storm water management.
- Public Wi-Fi. (especially at transit hubs, places where children may congregate to complete homework or adults may fill out employment applications). The roll out of LTE-U on Small Cells raises a concern that it may impair the use of public Wi-Fi.
- Fixed wireless sites for rural broadband. This could include using microwave based Wireless ISPs, or “WISPs” to serve areas that cable companies fail to, by using City owned towers and City-owned building rooftops as hubs to serve rural customers, remote business parks (read: economic development strategy), or even partner non-profits.
- Systems to support the First Responders Network (FirstNet) and provide high speed data communications to fire and police services.
- Mesh networks, and technologies not even yet contemplated.

“Not A Small Cell” in Oakland, California (bulky ground-mounted equipment cabinets lacking screening):⁹



⁹ Also see examples at <https://www.slideshare.net/omarmasry/a-city-planners-perspective-on-wireless-facility-siting> & www.tinyurl.com/10wirelesschallenges